

What is claimed is:

- 1 1. A converter comprising:
2 a transformer circuit including an input port and an autotransformer coupled to the
3 input port, the input port to receive an input signal;
4 a filter coupled to the transformer circuit, the filter to generate an output signal at
5 an output port; and
6 a controller coupled to the transformer circuit and the filter, the controller to
7 receive the output signal from the filter and to provide one or more control signals to the
8 transformer circuit to control the output signal.
- 1 2. The converter of claim 1, wherein the autotransformer comprises three coils.
- 1 3. The converter of claim 2, wherein a diode is connected between one of the three
2 coils and a port other than the input port.
- 1 4. The converter of claim 3, wherein the filter includes an inductor coupled directly
2 to the autotransformer.
- 1 5. The converter of claim 4, wherein the filter comprises a low-pass filter.
- 1 6. The converter of claim 4, wherein the controller comprises a synchronous buck
2 controller.
- 1 7. The converter of claim 1, wherein the autotransformer comprises two coils.
- 1 8. The converter of claim 7, wherein the input port is connected in series with a
2 switch and the autotransformer, and a diode is connected in parallel with the switch and
3 the autotransformer.

1 9. The converter of claim 8, wherein the switch comprises an insulated gate metal-
2 oxide semiconductor field-effect transistor.

1 10. The converter of claim 9, wherein the controller comprises a synchronous buck
2 controller.

1 11. The converter of claim 1, wherein the input signal has an input signal value and
2 the output signal has an output signal value and the output signal value is less than the
3 input signal value.

1 12. The converter of claim 11, wherein the input signal value is about forty-eight
2 volts and the output signal value is about six-tenths of a volt.

1 13. The converter of claim 1, wherein the converter further comprises a second
2 converter coupled to the output signal.

1 14. The converter of claim 13, where the second converter is operated 180 degrees
2 out of phase from the converter.

1 15. A method comprising:
2 receiving a first input signal at a transformer circuit including a first coil and a
3 second coil;
4 activating a first switch to serially connect the first coil to the second coil;
5 activating a second switch to connect the second coil to a second input signal;
6 deactivating the first switch and the second switch; and
7 activating a third switch to connect the filter input signal to the second input
8 signal.

1 16. The method of claim 15, wherein receiving the first input signal at the transformer
2 circuit including a first coil and a second coil comprises receiving a substantially direct
3 current voltage signal from a power source.

1 17. The method of claim 15, wherein activating the first switch to serially connect the
2 first coil to the second coil comprises activating the first switch from a first control signal
3 provided by a controller.

1 18. The method of claim 17, wherein activating the second switch to connect the
2 second coil to the second signal comprises activating the second switch from the first
3 control signal.

1 19. The method of claim 15, wherein deactivating the first switch and the second
2 switch comprises deactivating the first switch before deactivating the second switch.

1 20. The method of claim 19, wherein activating the third switch to connect the third
2 switch to the second control signal comprises activating the third switch after
3 deactivating the first switch and the second switch.

1 21. The method of claim 15, further comprising connecting the filter input signal to a
2 filter having an output signal and connecting a converter to the output signal.

1 22. A communication system comprising:
2 a transformer circuit including a first switch to receive a first signal, a second
3 switch to receive a second signal, an autotransformer coupled between the first switch
4 and the second switch, and a diode connected to the second switch and to receive the first
5 signal;
6 a filter coupled to the transformer circuit, the filter to generate an output signal;
7 a controller coupled to the transformer circuit and the filter, the controller to
8 receive the output signal from the filter and to provide one or more control signals to the
9 transformer circuit to control the output signal; and
10 a transceiver to receive the output signal.

1 23. The communication system of claim 22, wherein the transceiver comprises a base
2 station for a cellular communication system.

1 24. The communication system of claim 22, wherein the transceiver comprises a
2 cellular telephone.

1 25. The communication system of claim 22, wherein the transceiver comprises a
2 global positioning system transceiver.

1 26. A computer system comprising:
2 a processor; and
3 a converter including a controller coupled to an autotransformer and a filter to
4 provide power to the processor.

1 27. The computer system of claim 26, wherein the processor comprises a very-long
2 instruction word processor.

1 28. The computer system of claim 26, wherein the converter comprises a multi-phase
2 converter.